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Claremont McKenna College

IMPACT FROM TEXAS TORT LAW REFORM ON DAMAGES RECOVERED
EVIDENCE FROM CLOSED CLAIM ANNUAL DATA FROM 1988-2012

submitted to

Eric Helland

by

Richard Harris

for

Senior Thesis

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Acknowledgements

This thesis is dedicated to my two amazingly loving and supportive parents and two legends for brothers. I can't express how much I love you all. Without the four of you, I would not be the person I am today. I owe you all everything.

More than anything, this thesis is dedicated to my brother, Michael. I know you're probably laughing hysterically that I would dedicate something that you have absolutely no interest in to you. I doubt anyone would ever think that your name would be used in the same sentence as Texas tort law reform. But my senior thesis is about so much more than just the words. It's a moment for me to be proud that I got to this point. Without the strength you've given me and love you've instilled in me, I wouldn't be here. Words never do you justice. Love you always.

Abstract

This paper looks at Texas tort law reform to make claims regarding the relationship between Texas tort reform and damages recovered. Starting with reform in 1977, Texas has passed 15 pieces of legislation that, in principle, restrict the damages plaintiffs recover. Most empirical analyses have focused primarily on analyzing behavior resulting from the tort reform. In other cases, research has looked at the impact the most recent reform has had on damages recovered in medical malpractice lawsuits. This paper is the first to study the impact of Texas tort law reform on damages recovered while looking at the entirety of recent law reform in the state. Specifically, I test the impact of the 15 different laws on total allocated loss, economic loss, and noneconomic loss recovered in all cases from 1988-2012. My findings suggest that caps on medical liability damages are successful at decreasing damages recovered when the cap is geared at either noneconomic damages, or a total damage figure that excludes punitive damages. This suggests that future caps on medical liability damages should explicitly cap either economic or noneconomic damages. Next, the results imply that caps on punitive damage legislature were most successful when using specific value caps paired with an evidence standard—caps of this nature decreased total damages by 28% in 1987 and 85% in 1995. Finally, an introductory legislation restricting the use of joint and several liability in cases when plaintiffs had little guilt was successful, it decreased total damages by 18.6%. This was followed by three failed attempts to impact the application of joint and several liability where the guilt threshold was higher, suggesting that joint and several liability is rarely used if the plaintiff has substantial guilt.

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I. Introduction

There is a contentious debate regarding the ideal role tort law should play in each state. In particular, with sharp increases in health care costs, many look to tort law as a potential avenue for controlling the rising costs. Historically, the adoption of reform has been motivated as a way for the government to regulate costs at a state level. As a result, some legislation has capped damages paid, along with restricting scenarios in which a lawsuit can be filed. The question is whether or not the state level tort law reform succeeds at reducing payments in the tort system. By looking in depth at reform within Texas and the subsequent damages recovered, we have the opportunity to test the impact of these laws. While previous literature looks at behavior after reform, along with assessing the impact of the most recent Texas tort reform on medical malpractice lawsuits and corresponding payouts, this paper looks at the impact of the comprehensive recent history of tort reform and the impact those laws have on damages recovered.

Tort law in Texas is known for aggressive conservative measures geared at protecting defendants' rights and limiting the damages plaintiffs can recover. Starting with reform in 1977, Texas has passed 15 pieces of legislation that, in principle, restrict the damages plaintiffs recover. For the most part, the law reforms fall into three groupings—laws that limit recoverable damages in medical liability cases, caps on punitive damages, and restricting the application of joint and several liability. Texas' aggressive history of reform has given the state the label of “the tort reform state.” (LeMance 2015).

Most existing research focuses on the behavioral reaction to the changing laws. In particular, the most recent reform capping damages in medical liability cases has shifted the number of health care physicians in the state. Research shows that since the most aggressive medical liability reform in 2003 capping total damages, the number of physicians entering the state has increased by an average of 770 physicians each year compared to nine years prior (“10 Years of Tort Reform” 2013). Other research shows that since the reform, less money has been spent on defensive medicine—medicine doctors use to safeguard against a medical malpractice lawsuit. The report draws connections between the number of tort law reforms in each state and its negative relationship with health care costs (Hiltzik 2014). Some research contends that there is no evidence that the reform impacts health care costs (Paik et al., 2012).

However, there is little existing research that looks at the potential causal relationship between Texas tort law reform and damages rewarded. With tort law, doctors are inclined to engage in defensive medicine to ensure they don’t get sued (Hiltzik 2014). Some doctors may even leave a state to avoid a lawsuit (“10 Years of Tort Reform” 2013). The point of tort law reform is to undo these effects. In order for this to work, it follows that the payouts for plaintiffs are going to be lower. Has the reform succeeded at significantly impacting the size of damages recovered? While previous literature has briefly discussed the relationship between the 2003 noneconomic damage cap and payouts in medical malpractice cases (Hyman 2009), how has the entire recent history of Texas tort reform impacted damages recovered. This report studies the empirical relationship between Texas tort law reform and damages recovered in order to evaluate whether or not the legislature makes any meaningful impact. At the end of this report, I

am able to contribute meaningful evidence regarding the effectiveness of state level tort law reform in impacting payouts.

I estimate each law reform's effect on total allocated loss, economic loss, and noneconomic loss using the Texas Department of Insurance Closed Claim Survey. The Texas Department of Insurance Closed Claim Survey has expansive closed claim data on 225,791 observations beginning in 1988 and ending in 2012. In order to minimize multicollinearity, the law reforms that exist for the same period of time are grouped together into a single law reform variable. From this, the 15 law reforms are grouped into ten law reform variables. It's also important to note that multiple of these law groupings overlap in years because multiple laws exist during a specific year within 1988-2012. By controlling for injury type, policy type, yearly trends, and other law reforms, I am able to make objective conclusions on each law reform variable's impact on total allocated loss, economic loss, and noneconomic loss. Furthermore, in looking at the impact on each policy type, I can infer whether or not a law primarily impacts a specific area sector. For the remainder of this paper, I will refer to the different sectors as policy types.

In order to help organize the results and make claims regarding the impact of each law theme, the results section of this paper is organized into three sections—caps on medical liability damages, caps on punitive damages, and joint and several liability reform.

My findings for the first section suggest that the law reforms that cap damages in medical liability cases have mixed results. The first two reforms were passed in 1977 and are split in their effectiveness. The results suggest that a cap on total damages in medical

liability claims can have a substantial impact on economic and noneconomic damages, but if punitive damages are included in the total damages calculation, there is no perceived impact. In 2003, nearly 30 years later, a final law reform grouping geared at more effectively restricting damages in medical liability cases was passed. The results suggest that this reform succeeded at decreasing noneconomic damages by almost 10%. From this, we can infer that the influx of doctors into Texas post 2003 is consistent with the decreasing damages recovered. The success of this final law suggests that capping noneconomic damages specifically is an effective way to impact payouts within medical malpractice cases. Finally, my results suggest that the cap on noneconomic damages in medical liability cases created a culture of decreasing damages that pervaded into other policy types.

The second section of law reforms was aimed at capping punitive damages over time. After a failed attempt in 1973, a new legislation was passed in 1987 that successfully decreased total allocated loss by 28%. This lasted until 1995, when a Republican controlled legislature instituted a more restrictive reform that decreased total allocated loss by more than 85%. Taken together, my results suggest that after the first failed attempt, Texas legislators became more aware of the nature of punitive damage lawsuits in terms of size and ideal threshold of guilt, and as a result have succeeded at decreasing punitive damages over time.

Finally, the last section of reforms restricts the application of joint and several liability. Our findings imply that the first legislation with this aim succeeded in decreasing total damages by 18.6%. However, the following three joint and several

liability reforms result in no meaningful decrease to damages. While potential multicollinearity exists for these variables, our results do imply that Texas legislators were able to account for most joint and several liability applications in an introductory constraint, and were able to successfully limit damages recovered.

The paper proceeds as follows: Section II provides background information on tort law in Texas, the different kinds of damages in tort law, and previous research looking at Texas tort law reform. Section III highlights the data sources used. Section IV describes the empirical specification for our analysis along with laying out the organization of how our results are specified. Section V illustrates our results and implications for these findings. Finally section VI offers a conclusion and possible suggestions for future study.

II. Background

II.A. The Tort Reform State

The size and significance of Texas reform over the last twenty years has earned it the name of “the tort reform state” (LeMance 2015). See Table 1 in Appendix for a detailed description of the notable reform since 1987 compiled by Ronen Avraham at the University of Texas School of Law (Avraham 2014). The majority of the reform limits the damages plaintiffs can recover.

The debate over whether or not the significant tort law reform has a positive impact on Texas is incredibly contentious. It is worth noting that while the reform does span across multiple types of law, there is a substantial portion (especially some of the

more recent reform) that is specifically geared towards medical malpractice cases.

Advocates of the reform argue that it both encourages an influx of doctors into the state and decreases the dollars spent on defensive medicine. Since some of the most aggressive medical malpractice reform in 2003, the state has licensed on average 3,134 new physicians a year. This is nearly 770 more physicians when compared with the average nine years prior. This suggests that the significant reform encouraged doctors to work in Texas (“10 Years of Tort Reform” 2013). In addition to the influx of doctors, the new reform decreases the defensive medicine that is infamous for increasing health care costs. Defensive medicine is defined as any unnecessary treatment or service health care physicians perform in order to mitigate the potential of a medical malpractice lawsuit. In a study led by Michael Rothberg at the Cleveland Clinic and published in the Journal of the American Medical Association, Rothberg claims that spending toward defensive medicine is nearly 78 billion (Hiltzik 2014). By decreasing the likelihood of being slapped with a medical malpractice lawsuit, the reform discourages doctors from engaging in defensive medicine, in turn decreasing overall healthcare costs.

On the other hand, an argument can be made that the reform is disruptive because it can theoretically take advantage of the injured. The defensive techniques mentioned earlier often ensure consumers’ safety. One could argue that by discouraging doctors, automobile companies, product manufacturers, etc. from spending this defensive money, they’re simultaneously decreasing the safety of these products and services. Also, opponents argue that whether or not a threshold of liability has been reached by the plaintiff, if there is any fault of someone else damages should be recovered. By not holding those at fault accountable, and therefore limiting the amount defendants have to

pay, plaintiffs are unable to recover the complete size of the damages they deserve (Goguen 2015). By looking at the size of damages recovered before and after each reform, this report tests whether or not the legislation actually impacts the money plaintiffs receive.

II.B. The Different Components of Damages

In order to better understand the nature of the reform, and begin to recognize the impact it has on damages recovered, it's necessary to explore its various components. In this section of the paper, we will explicitly define the three components that make up the total damages recovered in tort law.

Economic Loss

According to Texas law, “economic damages means compensatory damages intended to compensate a claimant for actual economic or pecuniary loss” (“Civil Practice and Remedies Code” 2013). Put more simply, if a product or service causes personal injury to the consumer, the economic loss is the cost of the original product or medical cost, in addition to future medical costs and any lost wages. Economic loss is organized into two subcategories—direct economic loss and consequential economic loss (“Economic Loss Doctrine in All 50 States” 2015). The direct economic loss is the difference between the value of the product or service with and without the malfunction. This is also defined by the cost of replacement or to repair a product or service. For example, if a doctor is found guilty of medical malpractice during a patient’s back surgery and causes more damage, the direct economic loss is the cost of another surgery to repair the injury—the medical costs. The consequential economic loss is harder to

calculate—it’s all indirect loss of benefit from the service or product error. This includes any loss of profit due to one’s inability to use a product or lack of service performed. In the back surgery example above, the consequential economic loss is the patient’s lost wages caused by the additional weeks off of work. If the patient works in construction, he would not be able to go back to work for a longer period of time, potentially increasing the consequential economic loss substantially. The lawsuits analyzed in this report deal mostly with direct economic loss—in this case the medical costs as opposed to lost wages.

Noneconomic Loss

Texas law defines noneconomic loss as the “damages awarded for the purpose of compensating a claimant for physical pain and suffering, mental or emotional pain or anguish, loss of consortium, disfigurement, physical impairment, loss of companionship and society, inconvenience, loss of enjoyment of life, injury to reputation, and all other nonpecuniary losses of any kind other than exemplary damages” (“Civil Practice and Remedies Code” 2013). Because it is not a value that is traded on the market, but rather an impact on a person’s personal welfare, calculating a particular value can be problematic. However, depending on the nature of the case, because it is the effect on one’s own welfare, noneconomic losses can have a substantially larger impact than economic loss.¹ Using the example highlighted above of the medical malpractice lawsuit,

¹ In *Stacey Galette vs. Winthrop Hospital*, Galette sued the Brooklyn hospital for a botched surgery geared at removing an ectopic pregnancy. When the hospital was late in noticing a 5-millimeter hole in her colon, Galette had an infection that quickly led to blood poisoning. After extensive time in intensive care, she had both legs amputated and suffered significant hearing loss. The jury awarded Galette 62 million dollars total—\$20 million for past pain and suffering, \$38 million for future pain and suffering, and \$4 million for medical expenses. In this instance, the economic damages awarded were just \$4 million. However, due to

perhaps the error in surgery caused a back injury that is permanent. Now, the patient will suffer from mild back pain for the rest of his life. The resulting loss of enjoyment to his life is worth a lot more than the medical costs. In this case, the noneconomic loss is greater than the economic loss.

Punitive Damages

Punitive damages are the most disputed source of damages rewarded in lawsuits. In certain circumstances, if the court feels that the damages rewarded from the economic loss and non-economic loss are not a sufficient punishment, they add additional punitive damages. They are used primarily as a deterrence for the defendant, and others who may find themselves in an analogous situation, from future similar behavior. Punitive damages are often rewarded in situations where the defendant acts in a particularly unethical manner.² It's worth noting that while punitive damages only constitute 1-4% of total malpractice awards, the impact of punitive damages on physician behavior can appear much larger (Malani and Reif 2010).

the nature of the medical malpractice, the noneconomic loss was significantly larger. The \$20 million for past pain and suffering, and \$38 million for future pain and suffering, both are noneconomic damages recovered (Garcia, 2010).

² Henry and Lorraine Chanin sued the Teva Parenteral Medicine and Baxter Healthcare Services for claims that the product propofol, often used for anesthetic, can cause a patient to get hepatitis C. Henry Chanin was infected with hepatitis C in 2006 when he was given the anesthetic at Desert Shadow Endoscopy Center. The case relied on the fact that the drug packaging did not include sufficient warning that reusing the vials causes hepatitis C. Despite knowledge that the package had insufficient labeling, and that nurses were misinterpreting the vials ability to be reused, the drug companies continued selling them because they were profitable. The jury awarded Chanin \$356 million of punitive damages from Teva and \$144 million of punitive damages from Baxter, based on the profit figures from the companies. In this instance, punitive damages were awarded to punish Teva and Baxter for their unethical and dangerous behavior that caused a major spread of hepatitis C. Furthermore, by coming down hard on drug companies that choose personal profit over ensuring patient safety, the jury deters future instances of similar behavior from other drug companies (German et al., 2010).

II.C. Current Research Fails to Discuss Comprehensive Relationship between Reform and Payouts

As highlighted previously, Texas tort law reform has been a major source of debate over the last couple of decades. Given the large impact it has had on medical professionals behavior, and the perceived impact the reform has had on the entire tort law system, it's worthwhile to investigate the reform's influence on the various components of damages mentioned above. That is to say, quantitatively, what impact has the reform had on the economic loss, noneconomic loss, punitive damages, and total allocated loss rewarded to plaintiffs in Texas tort law. From this, I am able to discuss the effectiveness of tort law reform in impacting payouts.

As shown in *II. A. The Tort Reform State*, some previous research investigates the reform's impact on health care professionals behavior over time; there has been an influx of doctors into Texas, and potentially fewer "defensive surgeries". The American Medical Association no longer labels Texas as one of its states in crisis (Nixon 2013). Access to healthcare is clearly at unprecedented levels in Texas due to the huge increase in health care professionals ("10 Years of Tort Reform" 2013).

Avraham's paper *The Impact of Tort Reform on Employer-Sponsored Health Insurance Premiums* also makes claims regarding the tort reform's impact on defensive medicine and aggregate health care costs (Avraham, et al., 2010). President Obama contributed to the discussion on defensive medicine in fall 2009, stating, "I don't believe malpractice reform is a silver bullet, but I have talked to enough doctors to know that defensive medicine may be contributing to unnecessary costs" (Paik et al., 2012).

Avraham uses his research on tort law reform broken down by state to discuss the direct relationship between tort reform and aggregate health care costs by state—suggesting that as tort reform increases, defensive health care decreases” (Avraham, et al., 2010). This further implies that Texas doctors’ behaviors have in fact been shaped by the Texas reform—their fear of a medical malpractice lawsuit has decreased where they are no longer engaging in the same level of defensive health care, potentially cutting health care costs.

Bernard Black at the University of Northwestern School of Law looked more into the relationship between tort reform in Texas and aggregate health care costs. Dissimilar to Avraham, Black was unable to find any evidence showing a relationship between 2003 Texas tort reform and health care costs. By looking at Medicare spending and spending trends at the county level before and after the reform, the paper found no decrease in aggregate spending. In order to potentially control for increasing health care costs at a country wide level, the paper compared Medicare spending in Texas to spending levels and trends in other states at the same time. There was no evidence suggesting the 2003 tort reform impacted any Medicare spending in Texas (Paik et al., 2012). Still, this paper does not track the reform’s impact on the payout.

Before recently, there was not sufficient data to track the damages recovered over time in order to make claims on the impact the reform has had on size and quantity of tort lawsuits. The Texas Department of Insurance (TDI) has recently made available claim level data that is essential to our understanding of tort lawsuits in Texas. However, previous research has used this information primarily to analyze the relationship between

these lawsuits, the liability system in general, and the insurance market within Texas.

Kathryn Zeiler's paper on *Medical Malpractice Liability Crisis or Patient Compensation Crisis* uses the data to suggest a patient liability system in crisis, as opposed to a system that blames rising insurance premiums on the medical malpractice liability system. The paper claims that the patient liability system is in crisis because it "severely limit[s] the ability of the liability system to deliver civil justice negligently injured patients" (Zeiler 2009).

Perhaps the most relevant previous research comes from David Hyman and Bernard Black in 2009 in *Estimating the Effect of Damages Caps in Medical Malpractice Cases: Evidence from Texas*. In this paper, the researchers begin to look at the relationship between reform and payouts by estimating the impact of the 2003 Texas reform on all jury verdicts, post-verdict payouts, and settlements in medical malpractice cases closed in 1988-2004. The results suggest that the 2003 cap on noneconomic damages impacted 47% of verdicts by reducing the mean total payout by 27% and the noneconomic damages by 73% (Hyman et al., 2009). This evidence implies that the 2003 reform was successful at impacting medical malpractice damages recovered. However, this paper still does not discuss the history of Texas tort reform in its entirety. By narrowing in on one specific law from 2003 and focusing on the medical malpractice policy type, the paper is unable to make comprehensive claims regarding the tort reform system in Texas.

A later paper by Hyman and Black in 2013 discusses tort reform and payouts in medical malpractice lawsuits on a national level. Looking at national medical malpractice

claims in the 1990s and 2000s, the researchers find strong evidence that damage caps have a strong impact at reducing the payout per physician within a state (Paik et al., 2013). While this research aids our understanding on medical malpractice caps on damages recovered on a national level, it doesn't consider other policy types within tort law reform nor focuses its analysis on the complex history of Texas reform.

There is no current research with the main emphasis of exploring the quantitative impact that all tort law reform has had on payouts—both in terms of dollar value and size of damages recovered. That is to say that the current research does not provide evidence on the complete recent history of the reform's ability to influence payments. More than just the 2003 cap on noneconomic damages, how has the rest of Texas tort reform impacted damages recovered? Beyond solely medical malpractice lawsuits, how has the reform impacted other policy areas? While some reform geared at capping damages applies solely to medical malpractice lawsuits, has it created a culture of lower damages that has pervaded into other policy types? How has the other types of tort law reform, including restricting joint and several liability and placing caps on punitive damages, affected payouts? In this empirical work, we make connections between the comprehensive recent history of tort reform in Texas and its impact on the size of damages rewarded. From this, we are able to provide evidence regarding tort law reform's success in influencing payouts.

III. Data

My primary data source is the Texas Department of Insurance Closed Claim Survey. The Texas Department of Insurance aims to “regulate the insurance industry

fairly and diligently, promote a stable and competitive market, and provide information that makes a difference.” Created in 1876, the Texas Department of Insurance has a history of “protect[ing] policyholders and serv[ing] the greater public interest through the effective regulation of the U.S. insurance marketplace” (About TDI). As a subsector of the Property and Casualty Reports, the Closed Claim Annual Reports began collecting data in 1988 after a sudden increase in insurance premiums for medical malpractice cases (Zeiler 2009). The Closed Claim Survey collects entry level data, including information on liability, the type of injury, type of claim, jury verdicts, types of insurance used, and size of the economic loss, noneconomic loss, and total allocated loss in various situations. The survey collects information on 220 different variables in order to fully understand the nature of each claim. There are 225,791 entries from 1988-2012. Table 3 reports the descriptive statistics for every variable within the regression.

I ran three types of regressions, using three unique dependent variables—economic loss, non-economic loss, and total allocated loss. All of these variables were adjusted for CPI and brought from their value during the year of injury to their 2012 values. There are four types of variables controlled for in each regression. First, I controlled for type of injury, using binary variables for the 33 different injury types. If the injury occurred within the specific claim, the variable took on the number 1, and if it didn’t occur, it takes on a 0. Table 2 lists all of the variables used and the type of variable. The 33 different injury types are included as independent variables and highlighted in Table 2. The name of the variable highlights the nature of the injury. For example,

“railway” means injury on a railway while “eye injury (blindness)” means the injury caused the person to be blind.³

Next, I controlled for the five policy types included in the survey listed in Table 2.⁴ In the regression, the policy type variable is labeled as “categorical,” and would take on the value of 1-5 depending on the policy type. It would equal 1 if monoline general liability, 2 if commercial auto liability, 3 if texas commercial multiperil, 4 if medical professional liability, and 5 if medical professional liability. The descriptive statistics in Table 3 for the “categorical” variable is therefore not helpful for interpretation.

We also included year variables to account for the upward trend in damages awarded over time. Because this upward trend is not a result of the effectiveness of a law, year variables need to be included in the regressions. The year we included in the regression is the year the claim was closed. The average year used for the sample was 1990 and ranged from 1988 to 2010.

Finally, I generated law variables so we can read the impact that each existing law has on the loss values. Each law variable only exists for the time the law was effective—meaning if a law was adjusted after 3 years, the variable only exists for the three years the

³ This was important to control for in that the damages awarded to the more extreme injuries are larger. If our goal is to learn about the relationship between a law change and the different kinds of losses, we don’t want the varying injury severities to have an impact. In Table 3, it shows that 7.7% of injuries include death, while only .4% include falls. Because death is by nature more extreme, and would result in more extreme damages paid when compared with falls, we must control for it in order to limit its impact on the output variable.

⁴ This is also essential to control for because the size and nature of the payout for each policy type is innately different—the policy type impacts the size of economic loss, non-economic loss, and total allocated loss. We need to include these as independent variables in order account for this disparity.

law was effective. The laws used are the laws described in Table 1. The law reform is pulled from the Database of State Law Reforms (5th edition) compiled by Ronen Avraham at the University of Texas at Austin- School of Law in May 2014. The database includes the “most prevalent tort reforms in the United States between 1980 and 2012.” Avraham used existing data, original legislation, and case law to build the dataset. The fifth addition corrects for errors in the previous four editions and standardizes reform terminology (Avraham 2014). It is important to note that while there are 15 laws, there are only 10 law variables. Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability 2), and Periodic Payments (Medical Liability), Caps on Punitive Damages 2 and Punitive Damages (Evidence) 2, Caps on Punitive Damages 1 and Punitive Damages (Evidence) 1, Caps on Punitive Damages (Deceptive Trade Practice, Product Liability) and Comparative Fault were each combined into one variable each because they are effective for the same time period. That is to say that because both Caps on Punitive Damages 2 and Punitive Damages (Evidence) 2 were both effective on September 1, 1995, I only generated one variable to encompass both laws. Often times, these laws were part of a grouping geared at having one impact, in this case decreasing punitive damages awarded, so interpreting them as one variable makes sense. This also helps decrease multicollinearity within the regression. From this combined variable, we are able to interpret the impact both laws have on damages. See Table 4 for a graphical representation of the timing of the law changes to understand the law progression and which laws overlap.

IV. Empirical Specification

Theoretically, tort law reform in Texas would result in some sort of change in the level of payout—the extent of this change and the nature of what kind of damages it impacts is dependent on what reform we’re looking at. For example, if there is a law passed that caps noneconomic damages, one would assume that there were previous instances of noneconomic damages recovered greater than this cap. By getting rid of these high noneconomic damage payouts, there would then be smaller values of noneconomic damages rewarded overall. With our regression in mind, it would follow that “Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments (Medical Liability)” would decrease noneconomic loss.

From this theory, I concentrated the majority of my empirical analysis on the relationship between the law reforms and the changes in loss. I started by looking at the relationship between the law reforms and changes in total allocated loss. By comparing the direction and the extent of this change with the relationship between the law reforms and the changes in both economic loss and non-economic loss, I’m able to make more specific claims about the emphasis of each law reform and its pursuant effect.

In analyzing this impact, I used two different regression types for each of the three types of losses. First, I used regressions with all of the law variables included as independent variables. It is this type of regression that I used for the majority of the analysis. The regression results for this group are summarized in Table 5. It’s necessary to include each of the law variables in this regression group because it’s not as though only one law exists at once. Because these reforms build upon each other and often

overlap, we need to acknowledge that other laws are potentially impacting the dependent variables (the values of the damages) at the same time. By not including them, there would be omitted variable bias. Therefore, the three regressions in this grouping are of the following form:

$$1) \ln(g)_{ist} = \alpha + \beta_1 YearClaimClosed + \beta_2 Death_{ist} + \beta_3 Amputation_{ist} + \dots + \beta_{34} Other_{ist} + \beta_{35} Categorical_{ist} + \beta_{36} LawVariable1_{ist} + \beta_{37} LawVariable2_{ist} + \dots + \beta_{45} LawVariable10_{ist}$$

where i is denoted by the individual. The independent variable $YearClaimClosed_{ist}$ is an indicator that takes on the value of the year the claim was closed. For example, if the ist claim was closed in 1988, $YearClaimClosed_{ist}$ would equal 1988. $Death_{ist}$ is an indicator equal to one if the injury included death. This is the same way to interpret all 33 injury type variables from $Death_{ist}$ to $Other_{ist}$. $Categorical_{ist}$ is an indicator equal to 1 if the policy type is monoline general liability, 2 if commercial auto liability, 3 if Texas commercial multiperil, 4 if medical professional liability, and 5 if other professional liability. $LawVariable1_{ist}$ is an indicator if the law reform “Caps on Noneconomic Damages (Medical Liability 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments (Medical Liability)” is effective during the ist claim. Each law variable is a similar indicator variable if the law reform is effective for the ist claim. The dependent variable $\ln(g)_{ist}$ is the natural log of g where g is either total allocated loss, economic loss, or noneconomic loss. Finally, α is the constant term in the regression.

The summary table for the second regression grouping is shown in Table 6. In this grouping, I went through each of the ten law variables and created ten new regressions

that only have one law variable in each. This process was repeated for the three types of independent variables—total allocated loss, economic loss, and noneconomic loss. By comparing the coefficients of the law variables to the coefficients of the law variables in the first grouping of regressions explained above, I am able to assess the multicollinearity of each law. If the coefficients are drastically different between the two regression groupings for the same law variable with the same dependent variable, then it would follow that the law variable is strongly correlated with another one of the law variables. This serves as a check on the quality of the data. The regressions in this grouping are of the following form:

$$1) \ln(g)_{ist} = \alpha + \beta_1 \textit{YearClaimClosed} + \beta_2 \textit{Death}_{ist} + \beta_3 \textit{Amputation}_{ist} + \dots \beta_{34} \textit{Other}_{ist} + \beta_{35} \textit{Categorical}_{ist} + \beta_{36} \textit{LawVariableX}_{ist}$$

where all of the variables have the same denotation as the previous grouping of regressions. *LawVariableX_{ist}* is the law variable for the *X_{ist}* law where the *X_{ist}* law is one of the ten Texas tort law reforms laid out in Table 1.

In several instances, it is worthwhile to look at the specific policy type that is most impacted by each reform. In a few cases, the reform only applies to a specific policy type. For example, the reforms included in the variable “Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments (Medical Liability)” is specified to the medical liability policy type. As a result, one would think the impact on damages is solely on medical liability claims. This would suggest that in the regression, the only significant impact this reform has would be in the medical professional liability policy type. By analyzing the potential impact on

other policy types, we are able to discuss the degree of interconnectedness between each policy type within Texas tort law.

Finally, as shown in Table 1, a few of the law reforms have similar aims. For example, there are multiple laws that relate to capping medical liability damages, restricting joint and several liability, and capping punitive damages. My empirical analysis is not only focused on each law variable separately, but also groups the law variables together by reform type in order to comment on the success of each reform goal over time.

V. Results and Implications

The results are presented by reform grouping—caps on medical liability damages, caps on punitive damages, and joint and several liability reform. First, I analyze the impact of each law variable separately, and next I make assertions about the effectiveness of each reform grouping.

V. A. Caps on Medical Liability Damages

In this section, we analyze the three law variables, consisting of five law reforms, that relate to medical liability.

The history of Texas medical malpractice law reform began on August 29, 1977 when total damages for medical liability (excluding medical costs) were limited to \$500,000 (indexed to CPI). Theoretically the impact of this law would be to decrease the total damages rewarded, in turn limiting the defensive medical costs by ensuring doctors there won't be large claims brought against them. The name of this law variable in our

regression is “Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 2.” Part of this same law package however, and effective on the same August 29, 1977 date, is the second law reform, “Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 1.” This law also capped total damages for medical liability at \$500,000, however now both punitive damages and medical costs were excluded from this cap. The reason for not including them in the same law variable is that the first part, “Caps on Total Damages (Medical liability, Non Wrongful Death Claims) 2, officially ended in 1988. Because they were both listed separately, and one ended in 1988 while the other one still exists, I felt it necessary to include each of them as their own variable to isolate their potential success.

“Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 2,” the law that does not specify that punitive damages are excluded from the cap, does not show a significant decrease in total allocated loss. Rather, the coefficient from this independent variable is positive at .383, as shown in Table 5. This can be explained by the fact that when this specific law was taken out of action on May 11, 1988, there was another law that existed with a very similar aim, “Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 1.” The only difference between the two laws is that the second one excluded punitive damages from the cap on total damages. Therefore, it’s fair to argue that “Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 2” has no meaningful effect on the total damages.

However, there is a significant effect within the second part of the law package that still exists today, “Caps on Total Damages (Medical Liability, Non Wrongful Death

Claims) 1.” Because the cap on total damages for this law excluded punitive damages, and the total allocated loss figure included punitive damages, our empirical analysis only focuses on the economic loss and non-economic loss regressions. As shown in Table 5, since this law has been enacted, damages through economic loss are on average 42.9% lower, and damages through non-economic loss are on average 37.6% lower. This effect is statistically significant at the 1% significance level for both the economic loss and noneconomic loss regressions. This would suggest that the law succeeded in decreasing the size of total damages (excluding punitive damages).

By looking at the policy type specifications in Table 7, we can learn whether or not the law reform impacted the total allocated loss figure for all policy types. Did the law solely impact economic and noneconomic damages in the Medical professional liability policy type as intended, or did the cap on total damages create a culture of limiting damages that pervaded into other policy types? The results, as highlighted in Table 7, show no evidence that “Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 1,” geared at decreasing damages solely in Medical professional liability, decreases the total allocated loss in any of the policy types. This can potentially be explained by the fact that the law capped total damages excluding punitive damages, and therefore wouldn’t have an impact on a total allocated loss figure that included punitive damages from any policy type. Regardless, the results highlight how the law reform “Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 1” did succeed at decreasing economic loss and non-economic loss, and did not impact the total allocated loss figure for any policy type.

The final law reform in this grouping was adopted in early September 2003, and consisted of three parts. The first part, “Caps on Noneconomic Damages (Medical Liability) 2,” is a constitutional amendment that gave Texas Legislature the power to place limits on noneconomic damages for healthcare related lawsuits. The second part, “Caps on Noneconomic Damages (Medical Liability 1),” took advantage of the preceding amendment by capping noneconomic damages in medical malpractice cases against doctors to \$250,000 per facility and \$500,000 overall. The final part, Periodic Payments (Medical Liability), allowed the court to order future damages above \$100,000 be paid in periodic payments. The goal of all three of these laws was to expand upon the previous medical liability reform from nearly thirty years prior. By further capping damages, and giving guilty doctors the ability to pay large damages in periodic payments, the court aims to decrease the size of lawsuits filed against doctors. The results, laid out in Table 5, imply that the law succeeded in decreasing the noneconomic loss figure. More specifically, with the law reform package “Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments (Medical Liability)” effective, noneconomic loss decreased by 9.78%. This figure proved to be statistically significant at the 5% significance level. In line with the reform geared solely at affecting non-economic loss, there is no evidence of an impact on economic loss. These results imply that the reform was successful at limiting the damages filed against doctors, and that the substantial increase in physicians moving to Texas since this reform is warranted.

It is interesting to note that there is a significant decrease in total allocated loss within each policy type, not just within medical professional liability. Despite the nature

of the cap geared at decreasing noneconomic damages within the medical professional liability policy type, all of the policy types had a significant decrease in total allocated loss as shown in Table 7. This demonstrates the fact that a reform within one policy type has the potential to change the trend of damages within other policy types as well. In this case, the cap to noneconomic damages in medical professional liability pervaded into other policy types and led to across the board decreases. This suggests that lawmakers need to be conscious about the indirect effects of reform on other aspects of tort law.

V. B. Caps on Punitive Damages

The next grouping of laws includes four different law reforms—three related to capping punitive damages, and one introducing comparative fault. As described below, these reforms have been combined into three law variables for my analysis.

The first two law reforms were passed in 1973 and further limit the potential damages claimants can seek. Because of high correlation with one another, and in order to avoid multicollinearity, I have combined these reforms into one law variable: “Caps on Punitive Damages (Deceptive Trade Practice, Product Liability), Comparative Fault.” The first reform, “Comparative fault,” reduces the claimant’s damages by the proportion of his or her fault, and restricts claimants from filing damages if his or her fault is greater than 50%. Success for this law would result in both a decrease in the number of claims filed and a decrease in the size of the claim. The second reform, “Caps on Punitive Damages (Deceptive Trade Practice, Product Liability),” limits the size of the punitive damages to three times economic damages, with the aim of restricting large punitive

damage payments. Success for this reform would decrease the size of punitive damages recovered.

The results, however, suggest there is no evidence that the law variable “Caps on Punitive Damages (Deceptive Trade Practice, Product Liability), Comparative Fault” decreases punitive damages. Rather, there shows a significant increase in total allocated loss after the laws were enacted. However, when looking at the regression in Table 6, the regressions that only include the one relevant law variable, there is no evidence of an impact either way. This potentially suggests a correlation between “Caps on Punitive Damages (Deceptive Trade Practice, Product Liability), Comparative Fault” and the other laws. Initially, I thought one possible explanation for the lack of meaningful impact was that in capping punitive damages to three times the economic damages, economic damages increased as well. That said, there shows no evidence of an increase in economic loss since the law became effective, discounting this theory. According to the *Journal of Consumer & Commercial Law*, the extent to which this law was followed, meaning a conservative interpretation or a liberal interpretation of the law, has developed over time. Those enforcing the law have also varied in their level of enforcement (Alderman 2005). This large level of variability since the law was passed in 1973 can potentially explain the lack of punitive damage reduction. Furthermore, the same explanation can be given for lack of impact from “Comparative fault.” Perhaps the variability in “Caps on Punitive Damages (Deceptive Trade Practice, Product Liability)” limited the impact of “Comparative Fault.” Finally, perhaps there is no evidence that “Comparative Fault” impacted damages because it was common practice to not claim damages unless the plaintiff was less than 50% guilty. If the law solely put the state’s

practices into written law, rather than forcing these practices to change, there would be no significant impact on damages.

With ineffective punitive damage reform in the early 1970s, another law was passed in 1987, “Caps on Punitive Damages I.” “Caps on Punitive Damages I” limited punitive damages to either \$200,000 or two times the economic damages (whichever is greater), on top of no more than \$750,000 of noneconomic damages. This law expanded the previous one in 1973 by more specifically laying out the limit of punitive damages, with the aim of directly decreasing the size of punitive damages rewarded. The results in Table 5 suggest that total allocated loss decreased by 28% after the law become effective. This is highly significant at the 1% significance level. There is no evidence of a decrease in economic loss or noneconomic loss, implying the majority of the decreased total allocated loss is driven by a decrease in punitive damages. From this, we can confidently say that the law “Caps on Punitive Damages I” effectively reduced punitive damages.

This law lasted until September 1, 1995 when a new cap on punitive damages was passed. The final punitive damages reform, noted as “Caps on Punitive Damages 2,” limits punitive damages to the greater of \$200,000 or four times the amount of economic damages + noneconomic damages. According to the Journal of Consumer & Commercial Law, “the Republican controlled legislature enacted a broad reform agenda that attempt[ed] to limit the amount of damages... exempt certain large transactions, and make it easier for defendants to force a settlement” (Alderman 2005). Essentially, the goal of this law is to further increase the power of the defendants by limiting punitive damages. From the results in Table 5, we can infer that since “Caps on Punitive Damages

2” came into effect, total allocated loss has decreased by 85.4%. This figure holds at the 1% significance level. Both the changes in economic loss and noneconomic loss are not significant, implying that the large drop is driven by decreasing punitive damages. This effect is relatively extreme, highlighting the law’s impressive success over time.

In general, since a failed first attempt at capping punitive damages, Texas legislature has succeeded at reducing punitive damages.

V. C. Joint and Several Liability Reform

The final grouping of laws aims to restrict joint and several liability by prohibiting its application unless the defendant reaches a certain threshold of guilt. According to the American Tort Reform Association, “joint and several liability is a theory that permits the plaintiff to recover damages from multiple defendants collectively, or from each defendant individually” (Joint and Several Liability Rule Reform). Theoretically, if a state follows joint and several liability, a defendant who is just 10% guilty could end up paying for 100% of damages if the other defendants are unable to pay (“Joint and Several Liability Rule Reform | ATRA.”) Advocates of the rule site the plaintiff’s right to recover total damages from an injury minus his or her own fault. On the other hand, restricting this rule protects defendants from paying a disproportionate level of damages from their degree of fault (“Joint and Several Liability Rule Reform”). In limiting the use of joint and several liability, total damages would theoretically decrease—if a defendant doesn’t have to pay for another’s damages who can’t afford it, the plaintiff would not receive the same amount of damages on average.

The first legislation passed in Texas limiting joint and several liability reform was passed in 1985, and has since been amended three times, each time more and more restricting its application. In this section, by looking at the behavior of damages after each of the four laws pass, I am able to quantitatively measure the laws' effectiveness.

The first law in this grouping, "Joint and Several Liability 1," was passed on September 1, 1985 and prohibited joint and several liability in the case where a plaintiff is more guilty than a defendant. This would mean that if a plaintiff is 45% guilty, application of the rule is no longer allowed. From the results in Table 5, we can discern that total allocated loss decreased by 18.6% after this legislature became effective. This loss was driven by the 9% drop in economic loss, and large decrease in punitive damages. While the impact on total allocated loss and economic loss is significant at the 1% level, there is no sizable or significant effect on noneconomic loss. This effect not only shows the success of "Joint and Several Liability 1," but also suggests that an introductory constraint on the use of joint and several liability does succeed at limiting damages paid by defendants.

Starting with the first reform in 1987, three reforms have amended "Joint and Several Liability 1," adding what appeared to be more stringent constraints. "Joint and Several Liability 2," effective September, 1987 to September, 1995, prohibited joint and several liability in cases where the defendant is less than 20% at fault, or less than 10% at fault if the plaintiff has no guilt. "Joint and Several Liability 3," effective from September, 1995 to July, 2003, increased the threshold of defendant guilt to 50% if the plaintiff holds some blame, and 15% if the plaintiff is blameless. Finally, "Joint and

Several Liability 4,” effective since July 2003, prohibited joint and several liability in cases where the defendant is less than 50% guilty, regardless of the plaintiff’s level of guilt. However, Table 5 shows no evidence that “Joint and Several Liability 2,” “Joint and Several Liability 3,” and “Joint and Several Liability 4” decrease total allocated loss, economic loss, or noneconomic loss.

There are a couple potential explanations for this. First, perhaps the cases that took advantage of joint and several liability were solely those where the plaintiff was more guilty than the defendant. In this instance, after “Joint and Several Liability 1” was passed and outlawed its application in those cases, no one would have used the rule anymore. As a result, the following three laws may have worked to impact a rule that was no longer commonly used, and therefore had no impact on damages.

Another explanation could be the potential multicollinearity that exists between the last three joint and several liability laws and the other reforms. When looking at the set of regressions that include the individual law variables by themselves (Table 6), there is a highly significant decrease in total damages after each additional joint and several liability law is passed. While I don’t feel comfortable using these data points as evidence that the legislature was successful because of the omitted variable bias of excluding 9 other laws, it does suggest that multicollinearity potentially exists between the joint and several liability reforms.

V. D. Potential Flaws

One potential flaw in my analysis is the presence of multicollinearity. I attempted to mitigate this impact by grouping a few law reforms that had similar dates into one law

variable. Similarly, I include a series of regressions that only include one law variable at a time to check for possible correlation between the existing law variables. However, with this set of regressions there is omitted variable bias in that it assumes no other laws were passed. In cases where multicollinearity may be a problem, I acknowledge that when describing the results.

Another potential source of error could be the data itself. In Avraham's Database of State Law Reforms (5th edition), he mentions that this is the most prevalent law reform, however acknowledges that updates may be made as more information becomes available. Similarly, the Texas Department of Insurance Closed Claim Survey includes 225,791 entries from 1988-2012, accounting for 220 variables in each entry. Because of the expansive nature of the data in terms of number of observations and variables accounted for, it is possible that a few data points are inaccurate.

One thing my argument is missing is a comparison of this success with the success of other states. Throughout the paper I label Texas as the "tort reform state," but in order to gauge the reforms' success I would need a baseline of other state's success. What's more, it would be interesting to more extensively talk about the uniqueness of the specific reforms within Texas. How aggressive is this reform in limiting damages recovered when compared to other states? This would be worthwhile to expand upon in order to fully understand the uniqueness of Texas reform.

VI. Conclusion

With its aggressive history of tort law reform, Texas is known as the "tort reform state" (LeMance 2015). With a goal of shifting plaintiffs' behaviors, and decreasing

doctors' defensive behaviors, the reform has aimed to decrease damages rewarded. Most existing research has looked at changes in behavior after each reform. Previous research also discusses the impact a 2003 cap on noneconomic damages has had on damages recovered in medical malpractice lawsuits. However, this is the first paper to give a comprehensive empirical analysis on Texas tort law and the impact it has had on damages recovered. By analyzing the extent of each reform, and nature of its impact on the different aspects of damages, I am able to make conclusions on the impact of each law on damages recovered and make claims regarding the nature of effective state-level tort law reform.

The findings suggest inconsistent success in caps to damages in medical liability cases. The results imply that a cap to total damages in medical liability cases do show evidence of an impact, however only if punitive damages are not included in the total damage figure. When punitive damages were excluded in the cap to total damages, the reform decreased economic loss by 42.9% and noneconomic loss by 37.6%. What's more, the most recent legislature in 2003 succeeded at decreasing noneconomic damages by over 9%. These results suggest that future legislation should be geared at capping economic or noneconomic damages, but not a total damages figure that includes punitive damages. Other implications of these results revolve around healthcare physician behavior in Texas. With the lowered potential damages a physician may pay, it would follow that doctors are more comfortable with practicing medicine in Texas. The previous research highlighted in *II.C.* confirms an influx in doctors in Texas post reform. Another positive implication of the lower damages post the 2003 reform would be a decrease in healthcare costs for patients. One would think that because doctors are paying

lower damages to patients, they would charge less for services. As discussed in *II.C.*, other research has shown inconsistent evidence on the changing medical costs post reform. While defensive medicine seems to decrease (Avraham, et al., 2010), it appears that aggregate health care costs have stayed constant (Paik et al., 2012).

The most recent caps on punitive damages were successfully at limiting punitive damages rewarded. Since a failed attempt at restricting punitive damages in the early 70s, caps on punitive damage legislature decreased total damages by 28% in 1987 and 85% in 1995. This increase in effectiveness of each punitive damage law implies that Texas legislature is becoming more effective at restricting punitive damages—they are more aware of specifically how to impose a cap. The first failed cap solely limited the reward in respect to its relation to economic damages. However, the successful caps on punitive damages placed specific dollar values on the amount of the cap, and added requirements to the required evidence standard that must be proved. This suggests that in order to have the most success, legislature geared at capping punitive damages in the future must have specific value caps along with a description of an evidence standard.

Finally, with the goal of restricting use of joint and several liability, an introductory legislature effectively decreased total damages by 18.6%. This was followed by three additional amendments where no meaningful impact was found on damages rewarded. These results suggest that the application of joint and several liability is potentially outdated. Another potential implication is that this rule is only used in cases where the plaintiff has nearly no guilt whatsoever. Because the most recent legislation in 2003 prohibited the use of joint and several liability unless the defendant is 50% or more

at fault than the plaintiff, and there is no evidence of an impact on damages, one can assume the rule has never been used if the plaintiff has substantial guilt. As a result, in order to substantially lower damages recovered, any new restriction to the application of joint and several liability must mandate the plaintiff have essentially no guilt.

APPENDIX

Table 1. Texas Tort Law Reforms

Effective Date	Reform	Description
September 1, 1973	Comparative Fault	In an action to recover damages, the claimant damages are reduced in proportion to his own culpable conduct as compared to the defendant(s) culpable conduct. The claimant is barred from claiming damages if his culpable conduct is greater than the cumulative culpable conduct of all culpable defendants.
1973	Caps on Punitive Damages (Deceptive Traded Practice, Product Liability)	Limits the award of punitive damages to three times economic damages
August 29, 1977 to May 11, 1988	Caps on Total Damages (Medical Liability, Non Wrongful Death claims)	Limits total damages to \$500,000 (indexed to CPI). Medical costs are excluded from cap.
August 29, 1977	Caps on Total Damages (Medical Liability, Wrongful Death)	Total damages shall not exceed \$500,000 (indexed to CPI) in wrongful death actions. Medical costs are excluded from cap. Punitive damages are excluded from cap.
September 1, 1985 to September 2, 1987	Joint and Several Liability 1	Prohibits the application of joint and several liability unless defendant is more at fault than plaintiff
September 2, 1987 to September 1, 1995	Punitive Damages (Evidence) 1	Requires a plaintiff to show by a preponderance of the evidence that a defendant's actions were fraudulent, malicious, or grossly negligent
September 2, 1987 to September 1, 1995	Caps on Punitive Damages 1	Limits the award of punitive damages to the greater of \$200,000 or four times the award of actual damages. Caps do not apply for certain intentional acts that are also felonies.
September 2, 1987 to September 1, 1995	Joint and Several Liability 2	Prohibits the application of joint and several liability unless defendant is more than 20% at fault, or if plaintiff is blameless, defendant is more than 10% at fault, and there is a toxic tort.

September 1, 1995	Caps on Punitive Damages 2	Limits the award of punitive damages to the greater of \$200,000 or two times the award of economic damages plus non-economic damages up to \$750,000, with exceptions for certain intentional acts that are also felonies.
September 1, 1995	Punitive Damages (Evidence) 2	Requires that a plaintiff show by clear and convincing evidence that defendant is guilty of fraud, malice, or willful or wanton conduct
September 1, 1995 to July 1, 2003	Joint and Several Liability 3	Prohibits the application of joint and several liability unless defendant is more than 50% at fault, or if plaintiff is blameless, defendant is more than 15% at fault, and there is a toxic tort.
July 1, 2003	Joint and Several Liability 4	Prohibits the application of joint and several liability unless defendant is 50% or more at fault.
September 1, 2003	Periodic Payments (Medical Liability)	The court may, at the request of either party, order that future damages above \$100,000 will be paid in periodic payments
September 1, 2003	Caps on Noneconomic Damages (Medical Liability) 1	Limits noneconomic damages to \$250,000 in medical malpractice cases against doctors (\$250,000 per facility, with an overall cap of \$500,000).
Adopted September 13, 2003	Caps on Noneconomic Damages (Medical Liability) 2	Constitutional amendment that provides that the Texas Legislature has the authority to place limits on noneconomic damages for healthcare related lawsuits.

Table 2. Variable Description

Variable	Description
Independent- Year	Each year from 1988-2012
Independent- Law Reform	10 distinct law reform groupings
Independent- Injury Type	Death
Independent- Injury Type	Amputation
Independent- Injury Type	Burns (heat)
Independent- Injury Type	Burns (chemical)
Independent- Injury Type	Systemic poisoning (toxic)
Independent- Injury Type	Systemic poisoning (other)
Independent- Injury Type	Eye injury (blindness)
Independent- Injury Type	Respiratory condition
Independent- Injury Type	Nervous condition
Independent- Injury Type	Hearing loss or impairment
Independent- Injury Type	Circulatory condition
Independent- Injury Type	Multiple injuries
Independent- Injury Type	Back injury
Independent- Injury Type	Skin disorder
Independent- Injury Type	Brain damage
Independent- Injury Type	Scarring
Independent- Injury Type	Spinal cord injuries
Independent- Injury Type	Other injury
Independent- Injury Type	Off road vehicle
Independent- Injury Type	Air transportation
Independent- Injury Type	Railway
Independent- Injury Type	Other motor vehicle
Independent- Injury Type	Surgical/medical care
Independent- Injury Type	Falls
Independent- Injury Type	Drowning
Independent- Injury Type	Use of defective product
Independent- Injury Type	Fire
Independent- Injury Type	Firearms
Independent- Injury Type	Pollution/ Toxic exposure
Independent- Injury Type	Explosions
Independent- Injury Type	Use of agricultural machinery
Independent- Injury Type	Oil and gas extraction
Independent- Injury Type	Other
Independent- Policy Type	Monoline general liability
Independent- Policy Type	Commercial auto liability
Independent- Policy Type	Texas commercial multiperil
Independent- Policy Type	Medical professional liability

Independent- Policy Type	Other professional liability
Dependent	Total allocated loss
Dependent	Economic loss
Dependent	Non-economic loss

Table 3. Descriptive Statistics

VARIABLES	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Year Claim Closed	225,791	1,999	6.322	1,988	2,010
Death	225,791	0.077	0.266	0	1
Amputation	225,791	0.008	0.089	0	1
Burns (heat)	225,791	0.009	0.097	0	1
Burns (chemical)	225,791	0.003	0.052	0	1
Systemic poisoning (toxic)	225,791	0.009	0.096	0	1
Systemic poisoning (other)	225,791	0.001	0.038	0	1
Eye Injury (blindness)	225,791	0.006	0.079	0	1
Respiratory condition	225,791	0.012	0.111	0	1
Nervous condition	225,791	0.007	0.084	0	1
Hearing loss or impairment	225,791	0.003	0.052	0	1
Circulatory condition	225,791	0.004	0.062	0	1
Multiple injuries	225,791	0.171	0.377	0	1
Back injury	225,791	0.197	0.398	0	1
Skin disorder	225,791	0.002	0.050	0	1
Brain damage	225,791	0.022	0.146	0	1
Scarring	225,791	0.020	0.140	0	1
Spinal cord injuries	225,791	0.009	0.094	0	1
Other	225,791	0.124	0.330	0	1
Off road Vehicle	225,791	0.006	0.078	0	1
Air transportation	225,791	0.000	0.012	0	1
Railway	225,791	0.001	0.038	0	1
Other Motor Vehicle	225,791	0.264	0.441	0	1
Surgical/Medical care	225,791	0.093	0.290	0	1
Falls	225,791	0.094	0.291	0	1
Drowning	225,791	0.002	0.048	0	1
Use of defective product	225,791	0.024	0.152	0	1
Fire	225,791	0.004	0.064	0	1
Firearms	225,791	0.003	0.057	0	1
Pollution/Toxic exposure	225,791	0.011	0.106	0	1
Explosions	225,791	0.004	0.065	0	1
Use of agricultural machinery	225,791	0.001	0.037	0	1
Oil & gas extraction	225,791	0.003	0.059	0	1
Other	225,791	0.064	0.245	0	1
Categorical	225,789	1.921	1.152	1	5
Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments	225,791	0.542	1.153	0	3

(Medical Liability)

Caps on Punitive Damages 2, Punitive Damages (Evidence) 2	225,791	1.055	0.998	0	2
Caps on Punitive Damages 1, Punitive Damages Evidence 1	225,791	0.797	0.971	0	2
Caps on Punitive Damages (Deceptive Trade Practice, Product Liability), Comparative Fault	225,791	0.102	0.302	0	1
Caps on Total Damages (Medical Liability, Non Wrongful Death Claims) 2	225,791	0.997	0.053	0	1
Caps on Total Damages (Medical Liability, Wrongful Death) 1	225,791	1.997	0.077	0	2
Joint and Several Liability 4	225,791	0.184	0.388	0	1
Joint and Several Liability 3	225,791	0.343	0.475	0	1
Joint and Several Liability 2	225,791	0.571	0.495	0	1
Joint and Several Liability 1	225,791	0.047	0.212	0	1
Total Allocated loss	225,791	14,113	91,418	0	3.30E+07
Economic loss	225,791	11,960	114,308	0	1.33E+07
Non-economic loss	225,791	23,766	174,520	0	1.29E+07
ln(Allocated loss)	147,700	8.727	1.789	-0.564	17.31
ln(Economic loss)	42,176	9.782	1.417	2.931	16.4
ln(Non-economic loss)	49,634	10.340	1.396	3.985	16.37

Table 4. Texas Tort Law Timeline

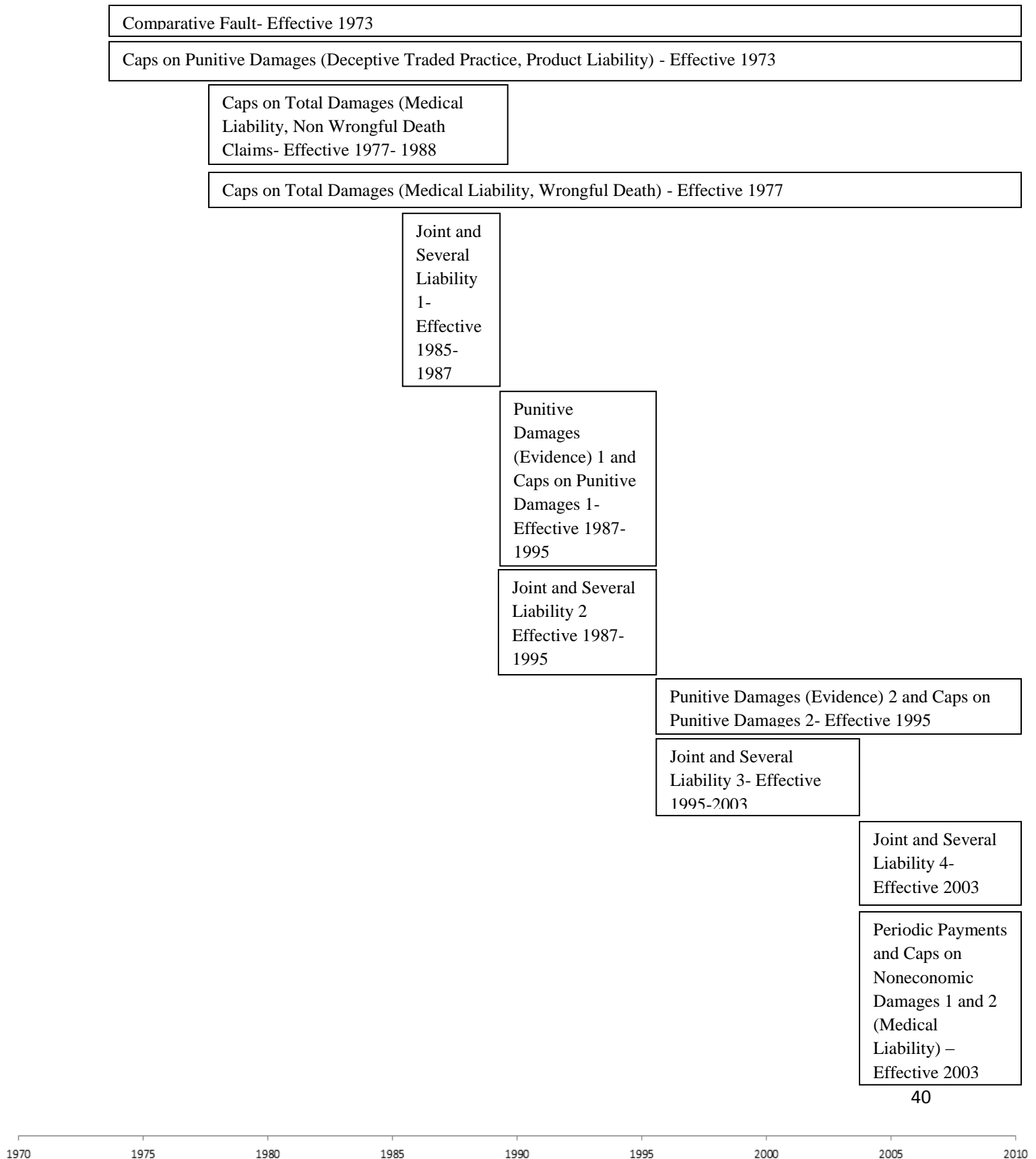


Table 5. Regression summary table using all laws in regressions

Law Names	Regression Type		Noneconomic Loss
	Total Allocated Loss	Economic Loss	
Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments (Medical Liability)	-0.117 (0.0736)	0.00313 (0.0517)	-0.0978** (0.0457)
Caps on Punitive Damages 2, Punitive Damages (Evidence) 2	-0.854*** (0.166)	-0.0366 (0.297)	-0.289 (0.265)
Caps on Punitive Damages 1, Punitive Damages Evidence 1	-0.280*** (0.0324)	-0.0213 (0.0401)	-0.0372 (0.0357)
Caps on Punitive Damages (Deceptive Trade Practice, Product Liability), Comparative Fault	0.306*** (0.0730)	0.0204 (0.113)	-0.000396 (0.0984)
Caps on Total Damages (Medical Liability, Non Wrongful Death Claims)	0.383*** (0.0258)	0.223*** (0.0332)	0.0222 (0.0295)
Caps on Total Damages (Medical Liability, Wrongful Death)	0.180 (0.115)	-0.429*** (0.159)	-0.376*** (0.141)
Joint and Several Liability 4	0.280 (0.337)	-0.153 (0.604)	0.671 (0.539)
Joint and Several Liability 3	0.626* (0.330)	-0.0475 (0.592)	0.547 (0.528)

Joint and Several Liability 2	-0.00679 (0.0705)	-0.0472 (0.0881)	0.0882 (0.0783)
Joint and Several Liability 1	-0.186*** (0.0251)	-0.0898*** (0.0312)	0.0121 (0.0274)

Notes: Table reports the coefficients for the linear regression of the impact of each law reform variable on either total allocated loss, economic loss, or noneconomic loss. Each cell within the table above represents a different regression. Each of the regressions also includes controls for the other law reform variables, year, policy type, and injury type. The standard error of each coefficient estimate is presented in the parentheses below. The asterix specifies the level of significance (* = 10%, ** = 5%, *** = 1%).

Table 6. Regression Summary Table Using Individual Laws in Regressions

Law Names	Regression Type		
	Total Allocated Loss	Economic Loss	Noneconomic Loss
Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments (Medical Liability)	-0.345*** (0.00789)	-0.0422*** (0.0148)	-0.0288** (0.0128)
Caps on Punitive Damages 2, Punitive Damages (Evidence) 2	-0.262*** (0.00695)	-0.0154 (0.0108)	-0.0229** (0.00912)
Caps on Punitive Damages 1, Punitive Damages Evidence 1	0.0185*** (0.00555)	-0.0453*** (0.00781)	0.00806 (0.00661)
Caps on Punitive Damages (Deceptive Trade Practice, Product Liability), Comparative Fault	0.0734 (0.0469)	-0.193** (0.0847)	-0.182** (0.0715)
Caps on Total Damages (Medical Liability, Non Wrongful Death Claims)	0.677*** (0.0161)	0.233*** (0.0207)	0.00492 (0.0179)
Caps on Total Damages (Medical Liability, Wrongful Death)	0.0283 (0.0714)	-0.378*** (0.116)	-0.362*** (0.0995)
Joint and Several Liability 4	-1.004*** (0.0234)	-0.130*** (0.0438)	-0.0657* (0.0380)
Joint and Several Liability 3	-0.128***	0.000477	-0.0244

	(0.0121)	(0.0194)	(0.0164)
Joint and Several Liability 2	-0.155*** (0.00988)	-0.0954*** (0.0144)	0.00722 (0.0122)
Joint and Several Liability 1	0.329*** (0.0181)	0.0828*** (0.0219)	0.000475 (0.0195)

Notes: Table reports the coefficients for the linear regression of the impact of each law reform variable on either total allocated loss, economic loss, or noneconomic loss. Each cell within the table above represents a different regression. Each of the regressions also includes controls for year, policy type, and injury type. The standard error of each coefficient estimate is presented in the parentheses below. The asterix specifies the level of significance (* = 10%, ** = 5%, *** = 1%).

Table 7. Policy Type Regressions

Law Names	Monoline general liability	Commercial auto liability	Texas Commercial multiperil	Medical professional liability	Other professional liability
Caps on Noneconomic Damages (Medical Liability) 1, Caps on Noneconomic Damages (Medical Liability) 2, Periodic Payments (Medical Liability)	-0.196*** (0.0564)	-0.348*** (0.0685)	-0.153** (0.0610)	-0.211** (0.0861)	-0.597* (0.338)
Caps on Punitive Damages 2, Punitive Damages (Evidence) 2	-1.227*** (0.242)	-1.332*** (0.427)	-0.562* (0.331)	-0.505 (0.489)	-0.343** (0.166)
Caps on Punitive Damages 1, Punitive Damages Evidence 1	-0.438*** (0.0617)	-0.326*** (0.0721)	-0.207*** (0.0513)	-0.280*** (0.0745)	-0.299 (0.320)
Caps on Punitive Damages (Deceptive Trade Practice, Product Liability), Comparative Fault	-2.580** (1.127)	0.134 (0.129)	0.251*** (0.0911)	0.765*** (0.218)	1.470** (0.595)
Caps on Total Damages (Medical Liability, Non Wrongful Death Claims)	0.706*** (0.0479)	0.180*** (0.0607)	0.146*** (0.0416)	0.403*** (0.0600)	0.791*** (0.273)
Caps on Total Damages (Medical Liability, Wrongful Death)	4.525*** (1.602)	0.277* (0.161)	0.0670 (0.160)	0.891*** (0.308)	-1.628 (1.014)
Joint and Several Liability 4	0.136 (0.490)	1.468* (0.862)	0.200 (0.675)	-0.656 (0.994)	0.438 (0.780)
Joint and Several Liability 3	0.659	1.650*	0.470	-0.363	

	(0.479)	(0.852)	(0.661)	(0.975)	
Joint and Several Liability 2	-0.119 (0.136)	0.0553 (0.156)	-0.118 (0.111)	-0.172 (0.164)	0.531 (0.705)
Joint and Several Liability 1	-0.439*** (0.0564)	-0.269*** (0.0470)	-0.144*** (0.0385)	-0.342*** (0.0609)	-0.00640 (0.221)

Notes: Table reports the coefficients for the linear regression of the impact of each law reform variable on the total allocated loss within each of the five policy types. Each cell within the table above represents a different regression. Each of the regressions also includes controls for the other law reform variables, year, policy type, and injury type. The standard error of each coefficient estimate is presented in the parentheses below. The asterix specifies the level of significance (* = 10%, ** = 5%, *** = 1%).

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